UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/473,103	12/28/1999	ANOOP GHANWANI	2204/150	9599

34845	7590	09/28/2004

STEUBING AND MCGUINESS & MANARAS LLP
125 NAGOG PARK
ACTON, MA 01720

EXAMINER
PRIETO, BEATRIZ

ART UNIT	PAPER NUMBER
2142	20

DATE MAILED: 09/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *28 May 2004*.

2a) ☐ This action is **FINAL.**   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-17* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-17* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____.

        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   This communication is in response to applicant's Appeal Brief filed 05/28/04, claims 1-17

remain pending.

2.   In view of the Appeal Brief filed on 05/28/04, PROSECUTION IS HEREBY REOPENED. New

grounds of rejection are set forth below. To avoid abandonment of the application, appellant must

exercise one of the following two options: (1) file a reply under 37 CFR 1.111 (if this Office action is

non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or, (2) request reinstatement of

the appeal. If reinstatement of the appeal is requested, such request must be accompanied by a

supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other

evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejection under 35 U.S.C. 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis

for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (e) the invention was described in a patent granted on an application for patent by another filed in the United
> States before the invention thereof by the applicant for patent, or on an international application by another who
> has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention
> thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA)

and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply

when the reference is a U.S. patent resulting directly or indirectly from an international application filed

before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C.

102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4.   Claim 17 is rejected under 35 U.S.C. 102(a) as being anticipated by Ericsson, Martin van der Zee,

July, pages 1-54 (Zee hereafter).

        Regarding claim 17, Zee discloses an information base including an entry correlating a first label

(AL1) from a first ("autonomous") system (e.g. A) to a second label (BL1) in a second ("autonomous")

system (e.g. B) (see figure 6 and table 3 on pages 31-32). Inter-domain or exterior routing protocols (e.g. BGP and IDRP) are used to exchange routing information between autonomous systems AS (section 3.4 on page 9-10), MPLS uses routing protocol BGP with label swapping paradigm (section 5.1.1). LSR router (Fig. 4 on page 12) contains an label map for mapping an incoming label to an outgoing label. LSR edge routers (Fig. 5) are routers with LSR functionality (page 21).

5.   Claim 17 is rejected under 35 U.S.C. 102(e) as being anticipated by Tappan U.S. Patent 6,473,421.

Regarding claim 17, a router using MPLS comprising a forwarding table ("information base") comprising an entry including a label associated with a received IP packet which maps that (incoming) label with a replacement (outgoing label) that specifies the next hop router (col 3/lines 6-16); router using MPLS receives packets from a first autonomous system and forwards said communication to another router using MPLS in a second autonomous system. Specifically, an autonomous system border router (ASBR) of a first autonomous system communicated with a second autonomous system using Border Gateway protocol (BGP) to support the exchange of information between a first autonomous system and a second autonomous system (col 5/lines 67-col 6/line 6). ASBRs using BGP communicate forwarding information to other ASBRs of other autonomous systems (col 6/lines 16-21) as well as to other ASBRs among themselves, i.e. within their autonomous system (col 6/lines 18-25); routers as well as ASBR well as exchange information including label information to populate their forwarding tables (col 6/lines 18-39, col 2/lines 3-10). Thereby, a ASBRouter using MPLS comprise a forwarding table ("information base") comprising an entry including a label associated with a received IP packet from a first autonomous system used for mapping that (incoming) label with a replacement (outgoing label) that specifies the next hop ASBRouter associated with a second autonomous system.

Claim Rejection under 35 U.S.C. 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7.   Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over MPLS Study, Project: Competence Center for ATM Components, Roth et. al., Research Institute of Open Communication Systems, pages 1-42 (referred to as Roth hereafter) in view of Tappan U.S. Patent No. 6,473,421.

Regarding claim 1, Roth discloses with respect to establishing label switched paths,

mapping in a label switching router (LSR) a first incoming label of an protocol message to a second next hop label associated with a next hop (sections 3.1-3.2 on p. 10-12);

swapping at said LSR said first label with a second label in said protocol message (section 3.2 on page 12);

forwarding at said LSR said protocol message to next hop device according to said second next hop label (section 3.1-3.2 on p. 10-12);

receiving at border router (BR) from a first autonomous system a protocol message from a second autonomous system i.e. inter-domain routing between Autonomous Systems via Border Router (BRs) (Fig. 1 on page 5) communicating using an inter-domain routing protocol (e.g. BGP-4);

wherein each router set up its routing table from the exchanged of reachability information using routing protocols (section 2.1 on pages 5-6); however Roth does not explicitly teach where the border router support inter-domain routing protocol for communicating between autonomous systems are label switching capable;

Tappan teaches a system/method related to label switching routers (abstract, col 3/lines 6-16), including where message routing protocol, such as a BGP routing support the exchange of information between different autonomous system, i.e. domains that are not commonly administered, wherein a label switching router operating at the border of said autonomous system communicated outside the autonomous system domain (col 5/line 65-col 6/line 6); and additionally, autonomous system border (label switching LSR) router uses BGP exterior routing protocol to communicate forwarding information to other autonomous-system border routers about exterior routers (col 6/lines 18-30).

It would have been obvious to one ordinary skilled in the art at the time the invention was made given the teachings of Roth that the border routers (BRs) communicating between autonomous system (ASs) are label switching capable routers located at the border of an autonomous system AS for communicating with another autonomous system, as exemplified by Tappan. Motivation to combine the teachings of Roth and Tappan would be to enable the border router label switching capable to support inter-communication between autonomous domains and concurrently support communication limited within an autonomous domain, as exemplified by Tappan.

8.   Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over MPLS Study, Project: Competence Center for ATM Components, Roth et. al., Research Institute of Open Communication Systems, pages 1-42 (referred to as Roth hereafter) in view of Network Working Group Internet Draft (NWGID), Rosen, E. et. al., Aug. 1997, pages 1-59 (Rosen hereafter).

Regarding claim 1, Roth discloses with respect to establishing label switched paths,

mapping in a label switching router (LSR) a first incoming label of an protocol message to a second next hop label associated with a next hop (sections 3.1-3.2 on p. 10-12);

swapping at said LSR said first label with a second label in said protocol message (section 3.2 on page 12);

forwarding at said LSR said protocol message to next hop device according to said second next hop label (section 3.1-3.2 on p. 10-12);

receiving at border router (BR) from a first autonomous system a protocol message from a second autonomous system i.e. inter-domain routing between Autonomous Systems via Border Router (BRs) (Fig. 1 on page 5) communicating using an inter-domain routing protocol (e.g. BGP-4);

wherein each router set up its routing table from the exchanged of reachability information using routing protocols (section 2.1 on pages 5-6); however Roth does not explicitly teach where the border router support inter-domain routing protocol for communicating between autonomous systems are label switching capable;

Rosen discloses a protocol architecture for multi-protocol label switching (MPLS) (abstract page 1) including an MPLS edge node as an MPLS node that connects an MPLS domain with a node in a different domain (section 1.2 on pages 5-7, see MPLS egress and ingress domain nodes on section 1.2 on pages 5-7), wherein an MPLS domain is a group of nodes which operate MPLS routing and are one routing or Administrative domain (section 1.2 on pages 5-7), i.e. an "Autonomous System"; further wherein Autonomous system are interconnected by means of BGP Border or Edge Routers, (Appendix B on page 55 see MPLS domain and edge node definition on page 6).

It would have been obvious to one ordinary skilled in the art at the time the invention was made that the border router supporting intercommunication between autonomous system discussed in the Roth reference are label switching capable as exemplified by Roth. One ordinary skilled in the art would have been readily apparent of the existing MPLS framework disclosed by Rosen including to use of MPLS egress node which handle traffic as it leaves an MPLS domain and MPS ingress node which handling traffic as it enters an MPLS domain for supporting routing at a first MPLS border (egress) router

associated with a first autonomous system, packets associated with a first label associated therewith to a second MPLS border (ingress) router associated with a second autonomous system associated with a second label associated with traffic entering therein.

Regarding claim 2, mapping, receiving, replacing and forwarding limitations are substantially the same as those disclosed on claim 1, same rationale of rejection is applicable, further

establishing an incoming label switched path associated with a first label over said first autonomous system (Rosen: ingress switched created path or route, where labels are assigned to routes associated with nodes e.g. ingress or egress nose of the label switched path (LSP) see section 2.13 on page 16, associated with an autonomous MLS domain see ingress domain node section 1.2 on pages 5-7);

establishing an outgoing label switched path over said second autonomous system (Rosen: egress switched created path or route, where labels are assigned to routes associated with nodes e.g. ingress or egress nose of the LSP see section 2.13 on page 16 associated with an autonomous MPLS domain see egress domain node section 1.2 on pages 5-7);

learning said second label associated with said downstream neighboring (next hop) device in said second autonomous system (Rosen: downstream nodes inform/distribute to upstream nodes label assignments, see section 2.4 on page 10).

Regarding claim 3, Label Distribution Protocol to setup said outgoing label switched path to a downstream neighboring border device (Rosen: section 2.5 page 11 and section 2.2 on page 32).

Regarding claim 4, establishing a Label Distribution Protocol session with said downstream neighboring (next hop) device to distribute label associated with said downstream neighboring (next hop) device (Rosen: section 2.4-2.5).

Regarding claim 5, creating/maintain in said label information base comprising an entry mapping said first label from said first autonomous system to said second label in said second autonomous system (Roth: sections 3.1-3.2 on p. 10-12).

Regarding claim 6, this apparatus claim comprises the logic operably for performing the method discussed on claim 1, same rationale of rejection is applicable.

Regarding claim 7, this claim comprises limitations substantially the same as those discussed on claims 1-2, same rationale of rejection is applicable.

Regarding claims 8-10, these claims are substantially the same as claims 3-5, respectively, discussed above same rationale of rejection is applicable.

Regarding claim 11, comprising the program product comprising a computer readable medium having embodied therein a computer program for performing the method discussed on claim 1, rejected for obviousness under U.S.C. 103, this same rationale is also applied to computer program product and logic means claims.

Regarding claim 12, comprising the program product for performing the method discussed on claims 1-2, rejected for obviousness under U.S.C. 103, this same rationale is also applied to program product and logic means claims.

Regarding claim 13, substantially the same as claims 8 and 3, rejected for obviousness under U.S.C. 103, this same rationale is also applied to program product and logic means claims.

Regarding claim 14, substantially the same as claims 9 and 4, rejected for obviousness under U.S.C. 103, this same rationale is also applied to program product and logic means claims.

Regarding claim 15, substantially the same as claims 10 and 5, rejected for obviousness under U.S.C. 103, this same rationale is also applied to program product and logic means claims.

Regarding claim 16, a plurality of Internet Autonomous systems (AS) interconnected by Border routers using an inter-domain routing protocol (e.g. BGP-4), wherein a first AS uses a first Border router device (BR) to access a second AS, said second AS uses said first BR to access said first AS, thereby said first BR is shared by said first AS with said second AS (see Roth: Fig. 1 on page 6). An MPLS edge node (i.e.BR) connects a first AS with a BR of a second AS (Rosen: see MPLS edge node definition of section 1.2 on pages 5-7 and Roth Fig. 1 on page 6 and Appendix A on page 55), MPLS nodes (e.g. BR) establish a labeled switch path over which packets are forwarded by label swapping (see Rosen: label switched path definition on section 1.2 on page 5). A label L becomes egress border (edge) LSR-1's (i.e. BR-1's)

"outgoing label" (from the first autonomous domain) corresponding to stream X and label L becomes ingress border (edge) LSR-2's (i.e. BR-2s) "incoming label" (from the second autonomous domain) for stream X (see Rosen: section 2.1 on page 10 and MPLS egress/ingress domain nodes on section 1.2 on pages 5-7), thereby, the shared BR links an incoming label switched path from an incoming autonomous system to an outgoing label switched path in an outgoing autonomous system.

9.   Applicant's arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

10.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prieto, B. whose telephone number is (703) 305-0750. The Examiner can normally be reached on Monday-Friday from 6:00 to 3:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's Supervisor, Jack B. Harvey can be reached on (703) 305-9705. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800/4700. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system, status information for published application may be obtained from either Private or Public PAIR, for unpublished application Private PAIR only (see http://pair-drect.uspto.gov or the Electronic Business Center at 866-217-9197 (toll-free).

Any response to this action should be mailed to:
          Commissioner of Patents and Trademarks
          Washington, D.C. 20231

or faxed to the Central Fax Office: (703) 872-9306, for Official communications and entry;
or Telephone: (703) 306-5631 for TC 2100 Customer Service Office.

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington VA, Fourth Floor (Receptionist), further ensuring that a receipt is provided stamped "TC 2100".

B. Prieto
TC 2100
Patent Examiner
September 19, 2004

JACK B. HARVEY
SUPERVISORY PATENT EXAMINER